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NanoSafer vs. 1.1 - Nanomaterial risk assessment using first order modeling

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Aim: Currently, there are no nanospecific safety data sheets (SDS) for manufactured nanomaterials (MN) and there is only limited data available on nanomaterial exposure levels. We have established an advanced control banding tool, NanoSafer, which enables alternative risk assessment and guidance for safe use of MN based on first order modeling.

Methods: Hazard and case-specific exposure assessments are combined for an integrated risk evaluation and banding. Requested material data are typically available from the producers' technical information sheets. The hazard data are given in the SDS for the closest analogue bulk material for which the requested occupational exposure limit (OEL) is given as well. The emission potential is either given by a constant release rate or the dustiness level determined using the EN15051 rotating drum or similar. The exposure assessment is estimated using the work room dimensions, ventilation rate, powder use rate, duration, and calculated or given emission rates. Scaling is based on direct assessment of hazard level and the estimated acute and work-day exposure levels divided by the OEL for MN taking the specific surface area into account.

Results: The NanoSafer control banding tool is now available in Danish and English with help tools, including a data-library with dustiness data and an inspirational nanosafety e-learning tool for risk management.

Conclusions: NanoSafer is the first CB tool using estimated hazard and exposure levels to MN using first order modeling. The ability to construct user specific work-scenarios for exposure assessment is considered a highly versatile approach.